REMARKS

Pending claims 1-7 and 9-20 have been rejected in this application. By this Amendment, claims 1, 9, 11, 15 and 16 have been amended to further clarify the features of the present invention. In addition, claims 2, 14 and 16 have been amended to address the editorial issues raised by the Examiner. The claim amendments are fully supported by the original claims and the specification. No new matter has been added. As such, claims 1-7 and 9-20 will remain pending in this application. The Examiner is respectfully requested to reconsider and withdraw the outstanding objections and rejections in view of the remarks contained herein.

Double Patenting (Provisional Rejection)

Claims 5 is provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 31 of copending U.S. Patent Applicant No. 09/665,950. In response, Applicants submit herewith a Terminal Disclaimer, signed by an attorney of record. Therefore, withdrawal of this rejection respectfully is requested.

Claim Objections

Claims 2, 14, and 16 were objected to because of minor informalities. Accordingly, these claims have been amended as suggested by the Examiner. As such, Applicants respectfully request withdrawal of these objections.

Claim Rejections – 35 U.S.C. § 103

The following rejections were set forth in the Office Action:

1) Claims 1, 3, 5, 9, 15-17 and 18 were rejected under 35 U. S. C. § 103 (a) as allegedly unpatentable over Miura (US 4,879,596).

2) Claims 2, 4, 10-13 and 14 were rejected under 35 U. S. C. § 103 (a) as allegedly unpatentable over Miura (previously cited) in view of Tanigawa (US 5,915,033).

3) Claims 6 and 19 were rejected under 35 U. S. C. § 103 (a) as allegedly unpatentable over Miura in view of Lipton (US 6,063,441).

4) Claims 7 and 20 were rejected under 35 U. S. C. § 103 (a) as allegedly unpatentable over Miura in view of Saneyoshi (US 5,410,346).

Regarding the first rejection, independent claims 1 and 15 have been amended to recite the following features: "wherein optical axes of said main camera and said sub-camera are inclined toward the main camera side with a predetermined angle defined by each of the optical axes and the shooting direction."

Applicants submit that this feature of independent claims 1 and 15 is not suggested, taught or hinted at in Miura. According to Applicants, Miura discloses a device where the adjustment of the optical axis of camera to left or right is performed in only one camera. However, Applicants believe that Miura's structure of rotatably adjusting both of cameras about the optical axes does not allow for adjustment of both cameras to the left or right. Therefore, in Miura, even if the main camera captures the target object on the main camera side, outside of the viewing area of the sub-camera, the optical axes of both of cameras are not inclined towards the main camera side as required in the present invention. In the present invention, the following effect is obtained by the above-mentioned feature, as described in page 11, lines 4-9 of Applicants' specification, the three-dimensional distance distribution having left-right symmetry

with respect to the shooting direction can be obtained. Miura, however, does not disclose the above-mentioned features and the resulting benefits of independent claims 1 and 15.

With regards to dependent claims 3 and 17, each of these claims has a feature such that the optical axis of the sub-camera is inclined toward the sub-camera side with respect to the optical axis of the main camera. In column 1, lines 39-47 of Miura, each of cameras needs to be adjusted above their optical axes so that left and right cameras images coincide with each other on "imaginary plane" in the predetermined distance. In contrast, the present invention performs the adjustment so that the left and right cameras images do not coincide with each other on "imaginary plane" in the predetermined distance. Thus, Miura does not suggest that above-mentioned features of the present invention.

Applicants further note that dependent claims 3, 4, 9, 11 and 17 have an optical axis of the sub-camera that is inclined toward the sub-camera side with respect to the main camera, which is not disclosed or suggested in any of cited references.

Miura does not disclose a structure that both cameras are inclined to left or right together, but discloses that one of cameras is inclined to left or right so that the predetermined convergence angle is obtained. However, Miura does not disclose or suggest the above-mentioned feature "the optical axis of the sub-camera is inclined toward the sub-camera side with respect to the optical axis of the main camera" in claims 3 and 17.

Dependent claim 16 has been amended to clarify that the "angles of inclination of said main camera and said sub-camera are set to be such angles that make an area substantially left-right symmetric with respect to a central axis of a vehicle parallel to the shooting direction, said area being an area of three-dimensional distance distribution obtained by an image processing unit on the basis of images photographed by said cameras".

The Office Action sets forth that Figure 6 of Miura discloses that if the shooting direction and the central axis of the vehicle coincide with each other, the three dimensional distance distribution becomes inherently left-right symmetric.

Applicants however contend that Miura performs the detection in an area where the reference and comparison images coincide with each other based upon someone's judgment using the liquid crystal shutter spectacles. In contrast, the present invention has a device that detects the corresponding area i.e. an image processing device.

Further, Applicants assert that dependent claims 3, 5, 9 and 16-18 are allowable based upon their dependency.

Regarding the second rejection, Applicants submit that claims 2, 4, 10-13 and 14 are allowable based upon their dependency. Applicants provide the following further comments.

Claim 2 has been amended to clarify that the three dimensional distance distribution is created by performing the search of the corresponding area and inclining in both of cameras by the angle so that the three dimensional distance distribution becomes the left-right symmetric with respect to the central axis of the vehicle.

Applicants contend that Miura has a structure having an optical axis of the sub-camera that is inclined towards the main camera side with respect to the optical axis of the main camera, contrary to the present invention, and that the infinite distance corresponding point which corresponds to the small area at edge of the reference image does not exist within the comparison image.

According to Applicants, the secondary reference Tanigawa discloses that by assembling errors of each of cameras, the deviation occurs between the position of the area in the reference image and the position of the corresponding area in the comparison image. With the correction

coefficient previously specified by taking the deviation into the consideration, the correction is performed for the calculated parallax so that the parallax can accurately calculated.

The structure of Tanigawa is that after searching the area where the image data coincide with each other, the correction is performed in the calculation of the parallax, and thus, when the area where the image data coincide with each other can not be searched, the parallax cannot correctly calculated even if the correction is performed. That is, if the indefinite distance corresponding point which corresponds to the small area at the edge of the reference image does not exist within the comparison image does to the assembling errors of the stereo camera, the parallax of the infinite distance corresponding point can not be calculated.

In contrast, the present invention has a structure that by inclining the optical axis of sub-camera towards the sub-camera side with respect to the optical axis of the main camera, the infinite distance corresponding point which corresponds to the small area at edge portion of the reference image can surely exist within the comparison image, and thus, the infinite distance corresponding point can be detected even if the there are the assembling errors.

Further Applicants note that in claims 10, 12, 13 and 14, the indefinite distance corresponding point which corresponds to the small area at the edge of the reference image can be detected. These claims have a feature such that in order to detect the infinite distance corresponding point, the optical axis is inclined toward the sub-camera side with respect to the optical axis of the main camera.

Regarding the third rejection, claims 6 and 19 are allowable based upon their dependency.

Regarding the fourth rejection, claims 7 and 20 are allowable based upon their dependency.

CONCLUSION

Applicants respectfully submit that this Amendment and the above remarks obviate the outstanding objections and rejections in this case, thereby placing the application in condition for immediate allowance. Allowance of this application is earnestly solicited.

If any fees under 37 C. F. R. §§ 1.16 or 1.17 are due in connection with this filing, please charge the fees to Deposit Account No. 02-4300, Order No 032405.043.

Respectfully submitted,

Date: September 7, 2004

Signature: _____ 52,567

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* Practice is limited to matters and proceeding before federal courts and agencies.